CIVIL QUALITY CONSULTANTS & ENGINEERS

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NABL Accredited As Per ISO/IEC : 17025:2005 Laboratory

Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21 Date 09.06.2020

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-11

Client : **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Mangaer (West), KRIDL,** Bangalore.

Name of Work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Date of Testing 09.06.2020

Material Type : Wet Mix Macadam

As per MORTH Table 400-13

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit	21.00	-
2	Plasticity Index, %		6.0% Maximum.

Note:

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ಎಸ್.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

Office & Laboratory : # 133, Bhuvaneshwarinagar, Dodda Basti Main Road, Bangalore - 560 056.
e-mail: civilqualityconsultants@gmail.com Ph: 080-23240644 / Mob: 8553518550

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09.06.2020

Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Mangaer (West), KRIDL,** Bangalore.
Name of Work	: Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Sample ID	WMM Layer
Date of Testing	09.06.2020

Result : Flakiness Index = **12.23%**

Elongation Index = **13.57%**

Result : Combined Flakiness & Elongation index **25.80%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21 Date: 09.06.2020

Aggregate Impact Value
IS: 2386 Part IV

Client	**Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Mangaer (West), KRIDL,** Bangalore.
Name of the Work	Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.
Type of Mix	Wet Mix macadam
Date of Testing	09.06.2020

Sl No.	Details	Trial No. 1	2	3	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	376	378	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	87	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	292	293	291	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.61	23.02	23.42	23.01

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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Job No: CQCR/BBMP/KRIDL/W.No.13/2020-21 Date 09.06.2020

GRADATION FOR WMM
MORTH TABLE-400-II

Client : **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency : **Technical Mangaer (West), KRIDL,** Bangalore.
Name of Work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Date of Testing 09.06.2020
Material Type : Wet Mix Macadam
Oven Dry.Wt 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	128	128	1.3	98.7	95-100
22.4	3265	3393	33.9	66.1	60-80
11.2	1784	5177	51.8	48.2	40-60
4.75	1658	6835	68.4	31.7	25-40
2.36	1234	8069	80.7	19.3	15-30
0.600	528	8597	86.0	14.0	8-22
0.075	749	9346	93.5	6.5	0-8

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21 25.06.2020

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Sheriyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Mangaer (West), KRIDL,** Bangalore.

Name of the work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Sample ID : Cement Concrete Cubes

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{20}

Compressive Strength as on : 28th day

SLNo.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm²)
1	28.05.2020	25.06.2020	8.201	513.2	22.81
2	28.05.2020	25.06.2020	8.236	524.6	23.32
3	28.05.2020	25.06.2020	8.204	533.8	23.72

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21

04.06.2020

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Mangaer (West), KRIDL,** Bangalore.

Name of the work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Sample ID : Cement Concrete Cubes

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{20}

Compressive Strength as on : 7th day

SLNo.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm²)
1	28.05.2020	04.06.2020	8.166	354.7	15.76
2	28.05.2020	04.06.2020	8.187	336.5	14.96
3	28.05.2020	04.06.2020	8.199	328.9	14.62

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21

25.06.2020

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Mangaer (West), KRIDL,** Bangalore.

Name of the work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Sample ID : Cement Concrete Cubes

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{20}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	28.05.2020	25.06.2020	8.250	512.4	22.77
2	28.05.2020	25.06.2020	8.247	525.6	23.36
3	28.05.2020	25.06.2020	8.231	531.7	23.63

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21 04.06.2020

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Mangaer (West), KRIDL,** Bangalore.

Name of the work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Sample ID : Cement Concrete Cubes

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{20}

Compressive Strength as on : 7th day

SLNo.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	28.05.2020	04.06.2020	8.155	352.1	15.65
2	28.05.2020	04.06.2020	8.192	341.7	15.19
3	28.05.2020	04.06.2020	8.164	360.0	16.00

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Job No: CQCE/BBMP/KRIDL/W No 13/2020-21 23.06.2020

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Manager (West), KRIDL,** Bangalore.

Name of the work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No 13, BBMP, Bangalore.

Sample ID : Cement Concrete Cubes

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{30}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	26.05.2020	23.06.2020	8.233	517.9	23.02
2	26.05.2020	23.06.2020	8.211	532.6	23.67
3	26.05.2020	23.06.2020	8.349	524.8	23.32

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21 02.06.2020

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Mangaer (West), KRIDL,** Bangalore.

Name of the work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Sample ID : Cement Concrete Cubes

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{20}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	26.05.2020	02.06.2020	8.167	366.5	16.29
2	26.05.2020	02.06.2020	8.183	352.1	15.65
3	26.05.2020	02.06.2020	8.199	348.7	15.50

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21

21/6/2020

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Mangaer (West), KRIDL,** Bangalore.

Name of the work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No 13, BBMP, Bangalore.

Sample ID : Cement Concrete Cubes

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{20}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm²)
1	26.05.2020	23.06.2020	8.222	510.2	22.68
2	26.05.2020	23.06.2020	8.209	524.9	23.33
3	26.05.2020	23.06.2020	8.237	530.0	23.56

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ಎಸ್.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21 02.06.2020

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Mangaer (West), KRIDL,** Bangalore.

Name of the work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Sample ID : Cement Concrete Cubes

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{20}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	26.05.2020	02.06.2020	8.152	336.9	14.97
2	26.05.2020	02.06.2020	8.164	342.1	15.20
3	26.05.2020	02.06.2020	8.187	350.0	15.56

Note:

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2. The results indicated above are based on the tests carried out on the samples received in the laboratory.
3. Any Query regarding the report must be reported within 30 days from the date of testing.

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Authorised Signatory

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21

Date: 23.05.2020

TEST RESULTS OF PHYSICAL PROPERTIES OF REINFORCEMENT STEEL

Client : **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Mangaer (West), KRIDL,** Bangalore.

Name of Work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Sample Identification : 8mm,10mm,12mm,16mm Fe 500 TMT Bars

Technical Reference : IS 1786:2008, IS 1608:2005, IS 1599:1985 (Reaffirmed 2006)

Date of test : 23.05.2020

S.No	Brand	Nominal size (dia in mm)	Mass per metre (kg/metre)	TENSILE STRENGTH		
				0.20 % proof stress/ yield stress ($N/mm^{2)}$	Tensile strength ($N/mm^{2)}$	Elongation, percent on gauge length
1	Fe 500	8	0.39	536	612	14
2	Fe 500	10	0.62	548	623	14.5
3	Fe 500	12	0.89	560	634	15
4	Fe 500	16	1.58	574	645	15.5

Remarks:

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Job No: CQCE/BBMP/KRIDL/W.No.13/2020-21 Date: : 21.05.2020

TEST REPORT ON COARSE AGGREGATES
IS 383-1970 (RA- 2002)

Client : **Assistant Executive Engineer**, Shettyhalli Sub Division, BBMP, Bangalore.
Agency : **Technical Mangaer (West), KRIDL**, Bangalore.
Name of Work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Date of Testing : 21.05.2020
Material : 20mm Aggregates

Total wt. of aggregates in gms = **5000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits
40	0	0	0	100	100
20	177	3.5	3.5	96.5	95-100
10	2589	51.8	55.3	44.7	25-55
4.75	1879	37.6	92.9	7.1	0-10

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21 Date : 21.05.2020

TEST REPORT ON COARSE AGGREGATES
IS 383-1970 (RA- 2002)

Client : **Assistant Executive Engineer**, Shettyhalli Sub Division, BBMP, Bangalore

Agency : **Technical Mangaer (West), KRIDL**, Bangalore.

Name of Work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Date of Testing : 21.05.2020

Material : 40mm Aggregates

Total wt. of aggregates in gms = **15000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits
80	0	0	0	100	100
40	228	1.52	1.52	98.48	95-100
20	5247	34.98	36.50	63.50	30-70
10	4529	30.19	66.69	33.31	10-35
4.75	4525	30.17	96.86	3.14	0-5

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21 Date : 21.05.2020

TEST REPORT ON FINE AGGREGATES (SAND)
IS 383-1970 (RA- 2002)

Client : **Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency : **Technical Mangaer (West), KRIDL,** Bangalore.
Name of Work : Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.

Date of Testing : 21.05.2020

Material : Sand Total wt. of aggregates in gms = **1000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits For Zone-II
10	0	0	0	100	100
4.75	52	5.20	5.20	94.8	90-100
2.36	136	13.60	18.80	81.2	75-100
1.18	149	14.90	33.70	66.3	55-90
600 Micron	221	22.10	55.80	44.2	35-59
300 Micron	162	16.20	72.00	28.0	8-30
150 Micron	187	18.70	90.70	9.3	0-10

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Job No.: CQCE/BBMP/KRIDL/W.No.13/2020-21 Date: 21.05.2020

TEST REPORT

CLIENT	:	**Assistant Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	:	**Technical Mangaer (West), KRIDL,** Bangalore.
NAME OF THE WORK	:	Improvements to Roads At Mallikarjuna Swamy Temple And Shreeshakthi Bhavana Surrounding Area in Ward No.13, BBMP, Bangalore.
SAMPLE ID	:	Cement (OPC 53 Grade Zuari Cement)
DATE OF MANUFACTURE	:	April-2020
DATE OF TESTING	:	19.05.2020 to 21.05.2020
SAMPLES SUPPLIED BY	:	AGENCY

The results of the tests conducted on the cement sample are as follows:

Sl.No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 12269-1987
1	a) Initial Setting Time	IS-4031 (Part -5)	120 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5)	435 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part 3) by the Le-Chatelier method	1 mm	Not more than 10 mm
3	Standard Consistency	IS-4031 (Part -4)	29.00 %	-

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